Practice: 366 - Anaerobic Digester

Scenario: #1 - Small Plug Flow <1000 AU

Scenario Description:

A plug flow anaerobic digester with less than 1000 animal unit capacity is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313)

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.

Typical Design Scenario: 910 animal units (650 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 910

Scenario Cost: $644,015.42 **Scenario Cost/Unit:** $707.71

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Plug Flow, Small (less than 1,000 animal units)	2478	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	##########	1	$642,998.32
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	1	$291.56
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51

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Scenario: #2 - Medium Plug Flow 1000-2000 AU

Scenario Description:

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation between 1,000 and 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.

Typical design scenario: 1,750 animal units (1,250 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,750

Scenario Cost: $881,590.39 **Scenario Cost/Unit:** $503.77

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Plug Flow, Medium (between 1,000 and 2,000 animal units)	2479	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	##########	1	$880,281.73
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	2	$583.12
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51

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Scenario: #3 - Large Plug Flow >2000 AU

Scenario Description:

A plug flow anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in absence of oxygen on a livestock operation with more than 2,000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A concrete, plug flow anaerobic digester is constructed with vertical side walls and a solid or flexible top. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.

Typical Design Scenario: 3,920 animal units (2,800 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 3,920

Scenario Cost: $1,319,070.44 **Scenario Cost/Unit:** $336.50

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Plug Flow, Large (more than 2,000 animal units)	2480	Concrete plug flow anaerobic digester which includes poured walls, floor and top, reception and mixing tanks, piping installed in and/or around the digester for circulating heated liquid to maintain the necessary temperatures for efficient digester operat	Each	##########	1	##########
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	3	$874.68
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51

Practice: 366 - Anaerobic Digester

Scenario: #4 - Small Complete Mix <1000 AU

Scenario Description:

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with less than 1000 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.

Typical Design Scenario: 1,039 animal units (742 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,039

Scenario Cost: $738,783.12 **Scenario Cost/Unit:** $711.05

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Complete Mix, Small (less than 1,000 animal units)	2481	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	##########	1	$737,766.02
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	1	$291.56
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51

Practice: 366 - Anaerobic Digester

Scenario: #5 - Medium Complete Mix 1000-2500 AU

Scenario Description:

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with 1,000 to 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.
Typical Design Scenario: 1,890 animal units (1,350 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 1,890

Scenario Cost: $1,288,983.35 **Scenario Cost/Unit:** $682.00

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Complete Mix, Medium (between 1,000 and 2,500 animal units)	2482	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	##########	1	##########
Mobilization						
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	2	$583.12
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51

Practice: 366 - Anaerobic Digester

Scenario: #6 - Large Complete Mix >2,500 AU

Scenario Description:

A complete mix anaerobic digester is installed as part of a waste management system to provide biological treatment of waste in the absence of oxygen on a livestock operation with more than 2,500 animal units. The process manages odors, reduces the net effect of greenhouse gas emissions, and/or reduces pathogens. The digester type selected is based on effluent consistency. Energy generation is not included.

Potential Associated Practices: Fence (382), Critical Area Planting (342), Nutrient Management (590), Waste Transfer (634), Heavy Use Area Protection (561), Roof and Covers (367), Waste Separation Facility (632), Waste Treatment Lagoon (359), and Waste Storage Facility (313).

Before Situation:

Manure and other agricultural by-products are not being controlled or utilized in an environmentally safe manner. The wastes are accumulating or being transported, but are not properly utilized or disposed of posing an environmental threat of excessive nutrients, organics, and pathogens being transported into surface and ground waters. The treatment of manure and other agricultural by-products is desired in order to manage odors and/or reduce pathogens.

After Situation:

A round, concrete or steel complete mix digester is constructed above ground. Components to maintain mesophylic or thermophylic temperatures for bacterial activity are included (i.e. piping and boiler or other heat source). Manure or other agricultural by-products are treated to manage odors and/or pathogens. Effluent from the digester is disposed of or utilized in accordance with a nutrient management plan.
Typical Design Scenario: 3,220 animal units (2,300 - 1,400 lbs dairy cows).

Scenario Feature Measure: Animals Units Contributing to Digester

Scenario Unit: Animal Unit

Scenario Typical Size: 3,220

Scenario Cost: $1,497,101.52 **Scenario Cost/Unit:** $464.94

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Acquisition of Technical Knowledge						
Training, Workshops	294	Educational seminar or series of meetings emphasizing interaction and exchange of information among a usually small number of participants.	Each	$44.18	2	$88.36
Equipment/Installation						
Complete Mix, Large (more than 2,500 animal units)	2483	A complete mix flow anaerobic digester includes the containment facility, agitation or stirring equipment, and any necessary reception and mixing tanks, Piping installed in and/or around the digester for circulating heated liquid to maintain the necessary	Each	##########	1	##########
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$291.56	3	$874.68
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	$556.67	1	$556.67
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	$80.51	1	$80.51